CLAIMS:

1. A method for recording data in an optical recording medium wherein data are recorded in a write-once type optical recording medium including at least one recording layer disposed on a substrate by projecting a laser beam whose power is modulated in accordance with a pulse train pattern including at least pulses whose levels are set to levels corresponding to a recording power and a bottom power onto the at least one recording layer and forming a recording mark in a predetermined region of the at least one recording layer, the method for recording data in an optical recording medium comprising a step of employing a pulse train pattern having the smaller number of pulses whose level is set to a level corresponding to a recording power as a linear recording velocity becomes higher and modulating the power of a laser beam thereby to form a recording mark in the predetermined region of the at least one recording layer.

2. A method for recording data in an optical recording medium in accordance with Claim 1, wherein the number of pulses is set to *1* in the case where data are to be recorded at a linear recording velocity equal to or higher than a first linear recording velocity VH.

3. A method for recording data in an optical recording medium in accordance with Claim 1 or 2, wherein in the case where data are to be recorded at a linear recording velocity VM lower than the first linear recording velocity VH and higher than a second linear recording velocity VL, the number of pulses is set to *1* at least when the shortest recording mark is to be formed and the number of pulses is set larger as the length of the recording mark to be formed becomes longer.

4. A method for recording data in an optical recording medium in accordance with Claim 1 or 2, wherein in the case where data are to be recorded at a linear recording velocity lower than the first linear recording velocity VH and higher than a second linear recording velocity VL, the number of pulses is set to *1* at least when the shortest recording mark is to be formed and the number of pulses is set larger as the linear recording velocity VM becomes lower.

5. A method for recording data in an optical recording medium in accordance with any one of Claims 1 to 4, wherein in the case where data are to be recorded by forming recording marks having respective lengths at a linear recording velocity, the number of pulses is set so that a difference between itself and the number representing a length of a recording mark is constant.

6. A method for recording data in an optical recording medium in accordance with any one of Claims 1 to 5, wherein the first linear recording velocity is determined to be equal to or higher than 10 m/sec.

7. A method for recording data in an optical recording medium in accordance with any one of Claims 1 to 6, wherein the bottom power is set to a higher level as the linear recording velocity becomes higher.

8. A method for recording data in an optical recording medium in accordance with any one Claims 1 to 7, wherein a ratio of the bottom power to the recording power is set higher as the linear recording velocity becomes higher.

9. A method for recording data in an optical recording medium in accordance with any one of Claims 1 to 8, wherein data are recorded in the optical recording medium by projecting a laser beam having a wavelength equal to or shorter than 450 nm thereonto.

10. A method for recording data in an optical recording medium in accordance with any one of Claims 1 to 8, wherein data are recorded in the optical recording medium by employing an objective lens and a laser beam whose numerical aperture NA and wavelength λ satisfy $\lambda/NA \leq 640$ nm, and projecting the laser beam onto the optical recording medium via the objective lens.

11. A method for recording data in an optical recording medium in accordance with any one of Claims 1 to 10, wherein the optical recording medium further comprises a light transmission layer, and a first recording layer and a second recording layer formed between the substrate and the light transmission layer, and is constituted so that the at least two recording marks are formed by projecting the laser beam thereonto, thereby mixing an element contained in the first recording layer as a primary component and an element contained in the second recording layer as a primary component.

12. A method for recording data in an optical recording medium wherein data are recorded in a write-once type optical recording medium including at least one recording layer disposed on a substrate by projecting a laser beam whose power is modulated in accordance with a pulse train pattern including at least pulses whose levels are set to levels

corresponding to a recording power and a bottom power onto the at least one recording layer and forming a recording mark in a predetermined region of the at least one recording layer, the method for recording data in an optical recording medium comprising a step of employing a pulse train pattern having a smaller number of pulses whose level is set to a level corresponding to a recording power as a ratio of a track pitch TP of the optical recording medium to a diameter of a spot of the laser beam becomes smaller and modulating the power of a laser beam thereby to form a recording mark in the predetermined region of the at least one recording layer.

13. An apparatus for recording data in an optical recording medium wherein data are recorded in a write-once type optical recording medium including at least one recording layer disposed on a substrate by projecting a laser beam whose power is modulated in accordance with a pulse train pattern including at least pulses whose levels are set to levels corresponding to a recording power and a bottom power onto the at least one recording layer and forming a recording mark in a predetermined region of the at least one recording layer, the apparatus for recording data in an optical recording medium being constituted so as to employ a pulse train pattern having a smaller number of pulses whose level is set to a level corresponding to a recording power as a linear recording velocity becomes higher and modulate the power of a laser beam thereby to form a recording mark in the predetermined region of the at least one recording layer.

14. An apparatus for recording data in an optical recording medium in accordance with Claim 13, wherein the number of pulses is set to *1* in the

case where data are to be recorded at a linear recording velocity equal to or higher than a first linear recording velocity VH.

15. An apparatus for recording data in an optical recording medium in accordance with Claim 13 or 14, wherein in the case where data are to be recorded at a linear recording velocity VM lower than the first linear recording velocity VH and higher than a second linear recording velocity VL, the number of pulses is set to *1* at least when the shortest recording mark is to be formed and the number of pulses is set larger as the length of a recording mark to be formed becomes longer.

16. An apparatus for recording data in an optical recording medium in accordance with Claim 13 or 14, wherein in the case where data are to be recorded at a linear recording velocity lower than the first linear recording velocity VH and higher than a second linear recording velocity VL, the number of pulses is set to *1* at least when the shortest recording mark is to be formed and the number of pulses is set larger as the linear recording velocity VM becomes lower.

17. An apparatus for recording data in an optical recording medium in accordance with any one of Claims 13 to 16, wherein in the case where data are to be recorded by forming recording marks having respective lengths at a linear recording velocity, the number of pulses is set so that a difference between itself and the number representing a length of a recording mark is constant.

18. An apparatus for recording data in an optical recording medium in accordance with any one of Claims 13 to 17, wherein the first linear

recording velocity is determined to be equal to or higher than 10 m/sec.

19. A write-once type optical recording medium comprising a substrate and at least one recording layer disposed on the substrate and being constituted so that data are recorded by projecting a laser beam whose power is modulated in accordance with a pulse train pattern including at least pulses whose levels are set to levels corresponding to a recording power and a bottom power onto the at least one recording layer and forming a recording mark in the at least one recording layer, the optical recording medium being recorded with data for setting recording conditions necessary for employing a pulse train pattern having a smaller number of pulses whose level is set to a level corresponding to a recording power as a linear recording velocity becomes higher and modulating the power of a laser beam thereby.

20. A write-once type optical recording medium in accordance with Claim 19, which further comprises a light transmission layer, and a first recording layer and a second recording layer formed between the substrate and the light transmission layer, and is constituted so that the at least two recording marks are formed by projecting the laser beam thereonto, thereby mixing an element contained in the first recording layer as a primary component and an element contained in the second recording layer as a primary component.

21. A write-once type optical recording medium in accordance with Claim 20, wherein the second recording layer is formed so as to be in contact with the first recording layer.

22. A write-once type optical recording medium in accordance with Claim 20 or 21, wherein the light transmission layer is formed so as to have a thickness of 10 nm to 300 nm.